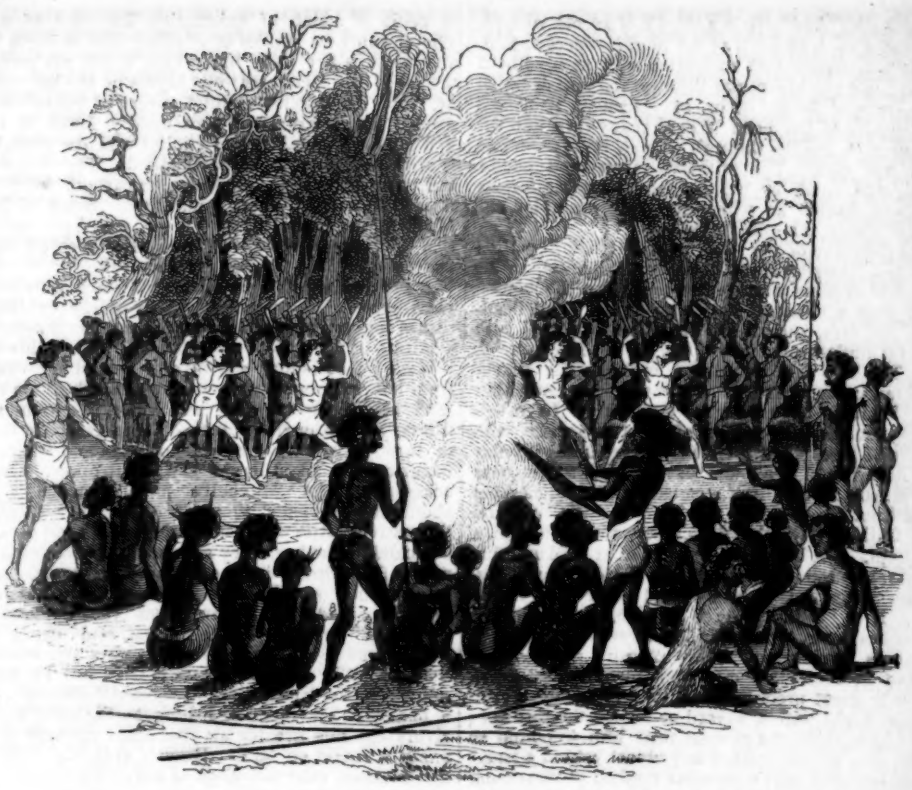


Corrobory Dance of the Natives.—From a print published at Sidney.]

## ABORIGINES OF AUSTRALIA.

It is not a century since the discovery of New Holland, or Australia, by Captain Cook, and for ages the aborigines had undisturbed possession of this vast territory, whose area is sixty times greater than that of England. They belong to two races, one the Malay, common to many of the islands north of Australia and of Polynesia; and the men of the second race, who have woolly hair, are considered as a branch of the African negroes; but in most other respects they differ from them. The natives of Malay origin are the superior race. Major Mitchell, who has explored fully a seventh part of Australia, estimates the native population spread over this portion of the country at less than six thousand. Proceeding along the coast from east to west, great uniformity of dialects is found; but in going from north to south there is often an entire difference in parts at no great distance from each other. Different tribes are found in succession along the courses of the principal rivers. On the Darling river, where fish and wild-fowl are tolerably abundant, the tribes remain almost stationary, at least the women and children, and some of the men, generally remain in one spot; but the tribes who do not live upon the coast or near the great rivers are necessarily migratory, as the pursuit of the opossum, the kangaroo, and the emu leads them over large tracts of country. As many as four hundred natives have been seen together in one encampment, reckoning three natives to each fire. Some of the tribes are remarkable for openness and frankness, while others are not to be trusted for a moment, and their countenances betray their treachery and implacability. A green branch borne in the hand is emblematic of peace, and their hostility is demonstrated by presenting a burning brand, by wild gestures and contortions, a furious dance, and by throwing up dust and spitting towards their opponents. In common with other uncivilized races, they possess great quickness of apprehension, a good memory, and a minute and accurate knowledge of localities; and Major Mitchell remarks that they never seem awkward, but in manners and general intelligence are superior to any white rustics he ever saw. Several natives who were sentenced at Sidney to work with the convict gangs were taught in about five months the art of stone-cutting and building, so as to be able to erect a small house; and they learned to read tolerably well in the same time. They sometimes become good shepherds.

Our limits will only permit us to give an account of their most striking habits and customs. Let us first give a picture of a native at a moment when he dreamt not of the white man being so near:—"His hands were ready to seize, his teeth to eat, any living thing; his step, light and noiseless as that of a shadow, gave no intimation of his approach; his walk suggested the idea of a prowling beast of prey. Every little track or impression left on the earth by the lower animals caught his keen eye, but the trees overhead chiefly engaged his attention. Deep in the hollow heart of some of the upper branches was still hidden, as it seemed, the opossum on which he was to dine. The wind blew cold and keenly through the lofty trees, yet that brawny savage was entirely naked." Major Mitchell, who gives this account, startled him with a loud halloo, on which he retired with a light bounding step peculiar to uncivilized man, but which may be described as a sort of

running walk. And here is a sketch of an old woman, presenting a contrast such as we might expect to find. She was "shortened and shrivelled with age, without clothing: one eye alone saw through the dim decay of nature—several large fleshy excrescences projected from the sides of her head like so many ears, and the jaw-bone was visible through a gash or scar on one side of her chin. The withered arms and hands, covered with earth by digging and scraping for the snakes and worms on which she fed, resembled the limbs and claws of a quadruped."

A girdle made of the wool of the opossum, with a sort of tail hanging down before and behind, is the only article of dress worn by the men; but the women usually wear a cloak of kangaroo skins. The head-dress of the men consists of a bandage whitened with pipe-clay, underneath which one of a red colour is worn. The body is often painted, broad patches marking the muscular parts of the breast, arms, and other parts. White is the colour for mourning. In travelling they erect a temporary shelter for the night with branches of trees; but their huts are coated with clay over a covering of grass and bark. The natives near the rivers are able to form a canoe by stripping a sheet of bark from a tree, filling up the ends with clay, and in this frail boat, which will scarcely sustain a man, a fire is kept. The bommereng is peculiar to Australia, and may be seen in some of the London toy-shops. Dampier described it as a sword something like a cutlas. It is "a thin curved missile, about two feet four inches long, which can be thrown by a skilful hand, so as to rise upon the wind with a rotatory motion, and in a crooked direction, towards any given point, with great precision, and to return after a considerable flight within a yard or two of the thrower; or, by first striking the ground near him, to bound so as to hit at a given distance any object behind a tree." The natives have also a peculiar method of increasing the impetus of a spear, by projecting it from a slight rod, about three feet long, with a niche at the end to receive the spear. Heavy jagged spears, made of hard wood, and set with flints, are used; others of reed, pointed with the bones of the emu, are employed in fishing; the kangaroo is killed with spears; stone-axes are used for cutting the opossum out of hollow trees; and they have a weapon of defence resembling a pickaxe, with one-half broken off and thickened at the angle. Since the discovery of the country by Europeans, the iron tomahawk has, in a few instances, found its way into the interior. The natives are often accompanied by dogs, but do not appear to derive much advantage from them; and they have, in fact, no keener faculties in the pursuit of wild animals than their masters.

The most valuable kinds of food are the flesh of the kangaroo, opossum, and emu; fish; and next reptiles, lizards, rats, larvæ, and various plants. The kangaroo deserts the country as soon as cattle are turned upon it, but a breed of wild cattle on the outskirts of the colony may probably compensate for the loss of the indigenous animal. The future increase of their numbers probably depends upon this contingency. Though living in a country far less productive than New Zealand, it is said that none of the tribes are guilty of cannibalism. The children subsist on a plant, which they are taught to procure for themselves as soon as they can walk, little wooden shovels being put into their hands for the purpose. The adults eat the same plant, and employ as much labour in searching and digging for it as would be sufficient to produce a cultivated crop. In their arid country, extreme thirst is often experienced as well as hunger, and to appease the former some succulent but not very palatable roots are sought after. Even the birds often reach the brink of pools in a state of exhaustion for want of water. The commonest modes of cooking are to dig a hole, and make a fire in it, into which stones are put, and the meat is placed between layers of the hot stones; or, when these do not abound, pieces of burnt clay are used. Explorers have occasionally found a snake grilling on a small fire of sticks; and the probability is that their food is always cooked. The root of the bulrush affords farina, and in some parts of the country it is obtained in great quantities. Some of Major Mitchell's exploring party made excellent cakes of this glutinous substance, "and they seemed lighter and sweeter than those of common cake."

A few notices of the methods by which they accomplish some of the main purposes of life exhibit the sort of ingenuity which necessity produces among men destitute of the arts of civilization. The following is a mode of obtaining a cool and refreshing draught from hot and muddy water:—they scratch a hole in the sand beside the standing pool, into which the water filters, and to purify it tufts of long grass are thrown in, through which the water, now cool and fragrant, is luxuriously sucked by the parched drinker. On one occasion, Major Mitchell's party reached a land abounding in honey, though without the assistance of the natives little or none would have been obtained; but catching a bee, they attached a light down to it with a little resin, the bee betrayed its home, and the lofty branch in which its store was concealed was quickly rifled. They approach the kangaroo by "stalking" with green branches and every other stealthy means. The opossum is obtained out of its hollow, not by cutting down the tree, but by making notches in the trunk, so as to render the ascent easy to a native. The mode of fishing by the natives on the rivers exhibits greater art than their methods of pursuing animals on land. Besides spearing fish from their canoes, osier net-work of very neat workmanship is stretched across a river, with a small opening towards the middle of the stream, where a bag or net may be placed. The fishing-nets are made by the women from flax growing on the borders of the river, and can scarcely be distinguished from those of our own manufacture. Very large nets are made, which are stretched across the Darling for the purpose of catching wild ducks as they fly along the river. Smaller sized nets are spread near pools frequented by birds, which resort to them from great distances. The women also drag the pools by a moveable dam of long dry twisted grass, which allows the water to pass while the fish are driven a-head. They are likewise very expert in procuring fresh-water muscles with their toes, and in fact the toes are nearly as useful prehensiles as the hand. When a native pilfers an article from a white, he usually takes it up with his toes, passes it behind his back, and conceals it under the arm-pit. Besides making nets, the women display their industry and skill in various other ways, and are patient and laborious drudges. They carry their children on their shoulders, and not in their arms; also bags, containing the whole of the property of the family, as nets, whet-stones, yellow, white, and red ochre; pins for dressing and drying skins or for net-making; small bommerengs and shovels for the children's amusement, besides other things. After a battle, they frequently follow the victors; and the loss of a wife is one of the heaviest calamities which can befal their husbands.

The natives of Australia believe in a good and evil spirit, and have numerous superstitions and customs of a religious nature. At the age of puberty, the youth of the male sex pass through a period of probation in solitude, and have one of their front teeth knocked out by a sort of priest. This mutilation distinguishes the least ferocious tribes. Dances are connected with their

hostile demonstrations, either to express their defiance or to stimulate their warlike fervour. The 'corrobory dance' is an amusement partaking in a slight degree of the nature of a rude drama. It is thus described by Major Mitchell:—"This amusement always takes place at night, and by the light of blazing boughs. They dance to beaten time, accompanied by a song, stretching a skin over the knees, and thus using the *tympanum* in its rudest form. The dancers paint themselves white, in such remarkably varied ways, that no two individuals are at all alike. The surrounding darkness seems necessary to the effect of the whole, all these dances being more or less dramatic; the painted figures coming forward in mystic order from the obscurity of the back-ground, while the singers and beaters of time are invisible, have a highly theatrical effect. Each dance seems most tastefully progressive, the movement being at first slow, and introduced by two persons displaying the most graceful motions both of arms and legs, while others one by one drop in, until each imperceptibly warms into the truly savage attitude of the 'corrobory' jump; the legs striding to the utmost, the head turned over one shoulder, the eyes glaring, and fixed with savage energy in one direction, the arms raised and inclined towards the head, the hands usually grasping waddies, bommerengs, or other warlike weapons. The jump now keeps time with each beat, and at each leap the dancer takes six inches to one side, all being in a connected line led by the first dancer. The line is doubled or tripled according to space and numbers; and this gives great effect, for when the front line jumps to the *left*, the second jumps to the *right*, the third to the *left* again, and so on, until the action acquires due intensity, when all simultaneously and suddenly stop. The excitement which this dance produces in the savage is very remarkable. However listless the individual, lying half asleep perhaps, as they usually are when not intent on game; set him to this dance, and he is fired with sudden energy, every nerve is strung to such a degree, that he is no longer to be recognised as the same individual, until he ceases to dance, and comes to you again."

## THE CONNECTION BETWEEN THE COLOUR AND THE ODOUR OF PLANTS.

Numerous as have been the investigations of naturalists respecting the growth and physiology of plants, there is one feature which, until the last few years, has scarcely met with the attention which it merits, viz. the connection between the colour and the odour of plants. Indeed the nature and source of odour generally have been but little investigated. The fragrance emitted by certain flowers is recognised as pleasing to the sense of smell, and as being different in different flowers; but beyond this point the information afforded us is of a very vague character. Within the last ten years, however, experiments have been made on this subject which merit a brief notice. The researches of De Candolle and other physiological botanists, into the cause of colour and odour in plants, we do not touch upon here; it is the apparent connection between the two which forms our subject.

Five or six years ago, Dr. Hope of Edinburgh pursued a train of investigation into the colour of plants, which, though not immediately referring to their odour, must be mentioned here. Dr. Hope applies the term *chromule* to all the coloured matters contained in the leaves and flowers of plants: the leaves containing green chromule; red flowers, red chromule; yellow flowers, yellow chromule; and so on. He next states that besides the chromule, there is a principle or substance, which, though not itself coloured, becomes so by the application of an acid or an alkali. This peculiar principle has been thought to be one and the same in all cases; but Dr. Hope has found from his experiments, that it is of two kinds, one of which becomes red by the action of acids, while the other becomes yellow or green by the application of alkalis. He distinguishes these from chromule by the term *chromogen*, or colour-producer; and further gives the names of erythrogen and xanthogen to the two varieties of chromogen. We shall, however, use the terms red chromogen and yellow chromogen: the former relating to a colourless substance which becomes red by exposure to acids; and the latter to another colourless substance which becomes yellow or yellowish-green by exposure to an alkali.

Dr. Hope then sought to find how these two kinds of chromogens, and many kinds of chromule, are distributed in different plants. He ascertained—1, That leaves in general contained green chromule and yellow chromogen, but seldom or ever red chromogen; 2, Out of thirty varieties of white flowers, none contained any tinted chromule nor red chromogen, but there was a little yellow chromogen; 3, In yellow flowers the yellow chromule varied in its character and tint, but was always present, together with yellow chromogen, but no red chromogen; 4, Blue flowers, orange-coloured flowers, and purple flowers, all contained both the red and the yellow chromogens, together with that particular tint of chromule which corresponds with their recognised colours; 5, Experiments made on various different parts of plants gave results similar to the above in respect of colour.

Other experiments on the same subject were made about the same time in Germany by Dr. Macquart, which in their results differ somewhat from those of Dr. Hope. Dr. Macquart thinks that all flower-leaves are originally green in the bud, and that they acquire their subsequent colour by certain changes in the green colouring substance. This substance is called *chlorophyll* or *chlorophyle*, and forms the colouring-matter of green leaves throughout their growth. The changes in this chlorophyle, by which green buds assume some other colour, Macquart states to be as follows:—That when water or its elements are removed from the chlorophyle, the colouring-matter for the blue, violet, and red flowers is produced; but that the addition of water or its elements produces the colouring-matter for yellow flowers. In investigating the steps by which the green chlorophyle of the original bud becomes a coloured flower of some other tint, he found that the transition from green to yellow is made without the intervention of any other tint; that red flowers become white in bud after losing the green tint, and before assuming that of red; and that blue flowers go through the gradation of green, white, red, and blue, in bud. There are certain discrepancies in the results of these two series of experiments, which show that the inquiry is yet in its infancy. Both series, however, agree in this, that yellow flowers contain a colouring principle of a peculiar kind which places them in a class different from most other coloured flowers.

Without regarding the actual cause of colour, experiments have been made within a few years to ascertain the relation, if any, which exists between colour and odour in plants as well as in other bodies. The 'Philosophical Transactions' for 1833 afford some interesting details on this point. Dr. Stark, while attending the anatomical rooms at the Edinburgh University, during the winter session 1830-1, perceived that when he wore a *black*-cloth dress his garments acquired a very disagreeable odour in the anatomical room, which they retained for a considerable time, whereas when he wore an *olive*-coloured dress no such inconvenience was experienced. The circumstance appeared to Dr.

Stark worthy of investigation; and he accordingly exposed small quantities of differently coloured substances to the action of odoriferous bodies, with a view to determine whether colour influenced the absorption of the odoriferous principle, whatever that may be. A small quantity of black wool, and an equal quantity of white, were exposed for six hours to the action of camphor, in a dark place, when it was found that the black acquired a much more powerful odour of camphor than the white. The experiment was repeated, but with the substitution of assafœtida for camphor; and in twenty-four hours the black wool had imbibed an offensive odour, whereas the white was almost inodorous. To determine whether vegetable substances gave similar results, Dr. Stark took small quantities of black and white cotton, and exposed them similarly to the action of camphor and of assafœtida; and in both cases the black cotton acquired more odour than the white.

After a while Dr. Stark extended his investigations to other colours. He inclosed equal weights of black, red, and white wool in a drawer with assafœtida, and similar portions in another drawer with camphor. In two other drawers he exposed black, red, and white *cotton*, in similar quantities, to the action of the same two substances; and in all four cases he found that the black acquired the greatest amount of odour, the red next, and the white scarcely any. The experiment was next repeated with silk, instead of wool or cotton, and with exactly similar results. A more extended range of colours was then selected, and experimented on in the following manner:—A piece of assafœtida was placed in a darkened spot, and around it were ranged six small pieces of wool, respectively coloured black, blue, green, red, yellow, and white, placed circularly, without touching the assafœtida or one another. At the end of twenty-four hours they were found to have imbibed odour in the following order as to intensity, black, blue, red, green, yellow, white, the black being most affected, and the white least. This experiment was repeated in six different forms, the coloured substances being wool, cotton, and silk, and the odorous substances assafœtida and camphor; and in every case the most powerful odour was acquired in the order given above, although wool imbibed more than cotton of the same colour.

Dr. Stark found that these phenomena were capable of being exhibited by the balance, as well as by the organ of smell; for he ascertained that if the coloured substance were accurately weighed before the experiment, and then exposed to the action of camphor slowly evaporated by heat, the coloured substance acquired an increase in weight; and that this increase was greater when the colour was black, and less when white, than with any other colour, the order being generally black, blue, brown, red, green, yellow, white. In these experiments by Dr. Stark the comparative odours of the differently-coloured substances were determined by a great number of persons, in order to avoid error as much as possible; and therefore the results stated seem worthy of attention.

In another extensive series of observations made by Schübler and Köhler in Tubingen, about ten years ago, the relation of colour and odour is attended to, more especially in reference to plants. These experimentalists examined the relations of the flowers of more than four thousand plants belonging to twenty-seven different families, of which twenty were of that kind denominated by botanists *dicotyledonous*, and the other seven *monocotyledonous*, implying respectively 'double seed-lobed' and 'single seed-lobed.' In most of the families all the available genera and species were examined; and in the others the most important.

There were two points to be determined: 1st, Out of 4200 species of flowers, how many there were of each colour; and, 2nd, how many of each colour were odorous; and the results gave—

| | Coloured Species. | Odoriferous Species. |
|---|---|---|
| White | 1194 | 187 |
| Red | 923 | 84 |
| Yellow | 951 | 77 |
| Blue | 594 | 31 |
| Violet | 308 | 13 |
| Green | 153 | 24 |
| Orange | 50 | 3 |
| Brown | 18 | 1 |
| | 4200 | 420 |

From this it appears that *white* is the most extensively distributed colour; and that the decided colours, red, yellow, and blue, are much more plentiful than violet green, orange, or brown; red and yellow being nearly equal, and not much less numerous than white. It appears also that about one-tenth part of the whole number are odorous; the white, which are the most plentiful, being also the most generally odorous; and among the other colours the red flowers have the greatest tendency, and the blue the least, to the formation of odoriferous substances.

An attempt was then made to separate agreeable from disagreeable odours; but this distinction we should think a vague one, because an odour which would be pleasant to one person might be unpleasant to another. According to the sensation of the experimentalists, however, it was found that white flowers are not only more generally odoriferous than others, but their odour is also more frequently agreeable than that of others; for in one hundred white-flowering plants there were on an average fifteen with agreeable odours, and only one disagreeable; whereas in one hundred variously-coloured plants the agreeably odorous were to the disagreeable only in the ratio of five to one, instead of fifteen to one.

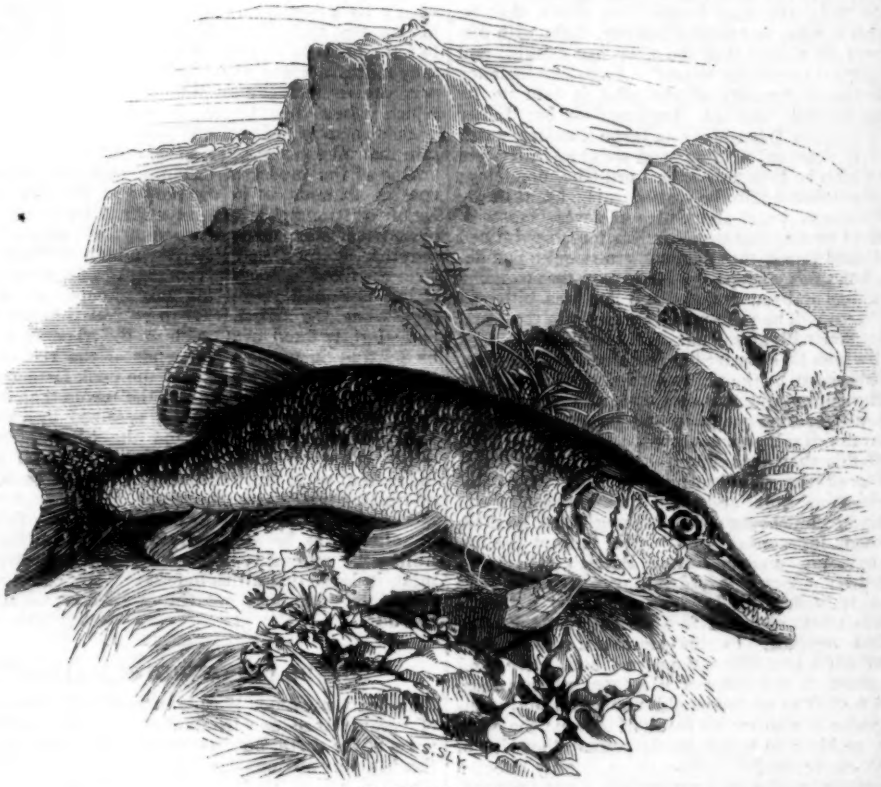
A further examination was made, in which the difference between light and dark tints was taken into account; a light tint being regarded as possessing a good deal of the character of a white flower, and therefore designated, perhaps erroneously, as having a considerable share of white mixed with it. Very extensive tables of classification were then formed, in which the prevailing colour of the flower is noted; then the distinctions of light, medium, and dark tints; and lastly, the number of odoriferous species in each. Of these tables we can only give the last, which is a summing-up of the whole:—

| Intensity of Colour in Flowers. | Mean number of Odoriferous Species in 100, according to the prevailing colour of the flowers. | | | | |
|---|---|---|---|---|---|
| | Red. | Violet. | Blue. | Green. | Yellow |
| With 0-12 per cent. white (dark) | 5·66 | .. | 1·63 | .. | 4·66 |
| With 12-70 per cent. white (medium) | 13·09 | 3·47 | 10·45 | 10 | 15·39 |
| With 70-100 per cent. white (light) | 38·99 | 24·39 | 12·90 | 20 | 24·65 |

It will here be seen that, omitting the colours of less frequent occurrence, the odoriferous qualities are possessed in the order red, yellow, violet, green, blue, after white, as the principal; and also that, taking any one colour, there are more odoriferous species of a light than a dark shade in that colour, the relation being expressed by saying that there is a larger per centage of white in the former than in the latter. The most odoriferous combination entered in the table is the red largely diluted with white, or light red, in which is probably included all the varieties of "rose-colour."

No odoriferous species are entered among the very dark violets or very dark greens.

It might appear at first thought that some of these results are inconsistent with those obtained by Dr. Stark; but it must be remembered that in one case we are treating of the natural odour of flowers, and in the other of odoriferous matters driven, as it were, into the coloured substance from without. We may find hereafter that all the results are consistent. At any rate the subject is well worth further investigation on the part of those who have time and opportunities for pursuing it.



[The Pike (*Esox lucius*).]

## THE PIKE.

Although the pike (*Esocidæ*) is now very common in most of our rivers and lakes, it is not supposed to be indigenous to this country, and was considered a great rarity for many years after its introduction. The pike is much esteemed as an article of food: large quantities are taken in the north of Europe, and dried for winter consumption. Horsea Mere and Heigham Sounds, in Norfolk, are the places most celebrated in England for the quantity and excellent quality of these fish caught there. The pike grows rapidly, and sometimes attains an enormous size. Some have occasionally been found in the lakes of Scotland and Ireland that have weighed upwards of seventy pounds. It is supposed also that the pike is the longest lived of any fresh-water fish. Izaak Walton tells us that Sir Francis Bacon "computes it to be not usually above forty years; and others think it to be not above ten years; and yet Gesner mentions a pike taken in Swedeland, in the year 1449, with a ring about his neck, declaring he was put into that pond by Frederic II. more than two hundred years before he was last taken, as by the inscription on that ring, being Greek, was interpreted by the then bishop of Worms." Walton then goes on to say "that it is observed, that the old or very great pike have in them more of state than goodness; the smaller or middle-sized pikes being, by the most and choicest palates, observed to be the best meat." The pike, being the largest fresh-water fish, eats in proportion to its size; it "has always been," says Mr. Yarrell, "remarkable for extraordinary voracity." "Eight pike, of about five pounds weight each, consumed nearly eight hundred gudgeons in three weeks; and the appetite of one of these pike," says Mr. Jesse, "was almost insatiable. One morning I threw to him, one after another, five roach, each about four inches in length: he swallowed four of them, and kept the fifth in his mouth for about a quarter of an hour, when it also disappeared."

The pike is considered to be the most expensive fish to maintain, in consequence of the immense quantities of food that it consumes and the extreme rapidity of its digestion. Izaak Walton says: "All pike that live long prove chargeable to their keepers, because their life is maintained by the death of so many other fish, even those of their own kind; which has made him by some writers to be called the tyrant of the rivers, or the fresh-water wolf, by reason of his bold, greedy, devouring disposition; which is so keen, that, as Gesner relates, a man going to a pond, where it seems a pike had devoured all the fish, to water his

mule, had a pike bit his mule by the lips, to which the pike hung so fast that the mule drew him out of the water; and by that accident the owner of the mule angled out the pike. And the same Gesner observes that a maid in Poland had a pike bit her by the foot, as she was washing clothes in a pond. And I have heard the like of a woman in Killingworth pond, not far from Coventry. But I have been assured by my friend Mr. Seagrave, that keeps tame otters, that he hath known a pike, in extreme hunger, fight with one of his otters for a carp that the otter had caught, and was bringing it out of the water." A curious instance of the extreme voracity of the pike is told us by Bowlker, in his 'Art of Angling:'—"My father catched a pike in Barn-Meer (a large standing water in Cheshire), was an ell long, and weighed thirty-five pounds, which he brought to the Lord Cholmondeley; his lordship ordered it to be turned into a canal in the garden, wherein were abundance of several sorts of fish. About twelve months after, his lordship drained the canal, and found that this overgrown pike had devoured all the fish, except one large carp that weighed between nine and ten pounds, and that was bitten in several places. The pike was then put into the canal again, together with abundance of fish with him to feed upon, all which he devoured in less than a year's time, and was observed by the gardener and workmen there to take the ducks and other water-fowl under water; whereupon they shot magpies and crows, and threw them into the canal, which the pike took before their eyes. Of this they acquainted their lord, who thereupon ordered the slaughterman to fling in calves' bellies, chickens' guts, and such like garbage to him to prey upon; but being soon after neglected, he died, as supposed, for want of food." We extract the following amusing anecdote from Fuller's 'Worthies, Lincolnshire:'—A cub fox, drinking out of the river Arnus in Italy, had his head seized on by a mighty pike, so that neither could free themselves, but were ingrappled together. In this contest, a young man runs into the water, takes them out both alive, and carrieth them to the duke of Florence, whose palace was hard by. The porter would not admit him without a promise of sharing his full half in what the duke should give him; to which he (hopeless otherwise of entrance) condescended. The duke, highly affected with the rarity, was about giving him a good reward, which the other refused, desiring his highness would appoint one of his guards to give him a hundred lashes, that so his porter might have fifty, according to his composition. And here my intelligence leaveth me, how much farther the jest was followed."

The pike swims with greater rapidity than any other fresh-water fish; its speed is sometimes extraordinary. He feeds usually on fish, and sometimes on frogs. Izaak Walton says, "It is observed that the pike will eat venomous things, as some kinds of frogs are, and yet live without being harmed by them; for, as some say, he has in him a natural balsam or antidote against all poison." It is supposed by the good old angler, who is somewhat credulous, that much antipathy exists between this fish and some species of frogs; to corroborate this supposition, Walton extracts a long anecdote from Dubravius's book of 'Fish and Fish-ponds,' which we will give in his words, without at all requesting the confidence of our readers in the story:—"As he (Dubravius) and the Bishop Thurso were walking by a large pond in Bohemia, they saw a frog, when the pike lay very sleepily and quiet by the shore side, leap upon his head; and the frog having expressed malice or anger by his swoln cheeks and staring eyes, did stretch out his legs and embrace the pike's head, and presently reached them to his eyes, tearing with them and his teeth those tender parts: the pike, moved with anguish, moves up and down the water, and rubs himself against weeds and whatever he thought might quit him of his enemy; but all in vain, for the frog did continue to ride triumphantly, and to bite and torment the pike till his strength failed; and then the frog sunk with the pike to the bottom of the water; then presently the frog appeared again at the top, and croaked, and seemed to rejoice like a conqueror, after which he presently retired to his secret hole. The bishop, that had beheld the battle, called his fisherman to fetch his nets, and by all means to get the pike, that they might declare what had happened; and the pike was drawn forth; and both his eyes eaten out; at which when they began to wonder, the fisherman wished them to forbear, and assured them he was certain that pikes were often so served."

One of the modes of catching the pike, where the species abounds, as in the Meres of Norfolk, is by a ligger or trimmer, which, says Mr. Yarrell, "is a long cylindrical float, made of wood or cork, or rushes tied together at each end; to the middle of this float a string is fixed, in length from eight to fifteen feet; this string is wound round the float except two or three feet, when the trimmer is to be put into the water, and slightly fixed by a notch in the wood or cork, or by putting it between the ends of the rushes. The bait is fixed on the hook, and the hook fastened to the end of the pendent string, and the whole then dropped into the water. When the bait is seized by a pike, the jerk looses the fastening, and the whole string unwinds, the wood, cork, or rushes, floating at the top, indicating what has occurred." The common modes of trolling need not be described.

The pike is supposed to be a melancholy fish, fond of solitude, as he is usually observed to swim alone, unlike the generality of fish, who seem to prefer swimming in large quantities together. His courage is remarkable. He does not fear a shadow, as all other fish do.

## THE BOATS OF RUDE NATIONS.

The boats or canoes of rude nations bear strong marks of resemblance one to another, not only in different parts of the earth, but in different ages. The reason for this is a very obvious one, viz., that the materials out of which a hollow shell, capable of floating on water, might be constructed, are within the reach of most infant nations, such as a tree to be hollowed within, or reeds to be twisted together and covered with a skin. The ancient Britons used boats or canoes belonging to both these classes. The coracles of our ancestors were seen on the British rivers at the time of Julius Cæsar's invasion; and were constructed of wicker-work covered with hides. The Irish name *currach*, and the Welsh *cwrwgyl*, probably point to the use of similar boats in Ireland and Wales at the present day; for Dr. Southey remarks, in his 'Lives of the British Admirals,' that "Coracles thus made, differing only in the material with which they are coated, and carrying only a single person, are still used upon the Severn, and in most of the Welsh rivers. They are so small and light, that when the fisherman lands he takes his boat out of the water and bears it home upon his back. In the management of such slight and unsteady vessels great hardihood and dexterity must have been acquired, especially in a climate so uncertain and in such stormy seas as ours."

That the Britons were acquainted with the mode of constructing boats, or rather canoes, from the hollowed trunks of trees, many evidences remain to show. In a morass called Lockermoss in Dumfries, Scotland, an ancient canoe was dug up in the year 1736, with a paddle near it; the canoe was about seven feet long, and

dilated to a considerable breadth at one end. Another canoe, hollowed out of a solid tree, was seen by Mr. Pennant near Kilblain; it was about eight feet long by eleven inches deep. In the year 1720 several canoes of similar construction were dug up in the marshes of the river Medway, above Maidstone, one of which was still in such a state of preservation as to be used as a boat for some time afterwards. On draining Martine Muir, or Marton Lake, in Lancashire, some years ago, there were found, embedded in the bottom of the lake, eight canoes, each made of a single tree. The oak of which these several canoes were made was found on examination to be remarkable for the free grain of the timber; insomuch that several millwrights and carpenters have expressed their opinion that the oak was of foreign growth, and the produce of a warmer country. To this opinion Dr. Southey objects, "that the canoes could not have been brought there from any warmer country seems certain; and if any inference can be drawn from the grain of the wood, as indicating its growth in a warmer climate, it would seem to be that these canoes were made when the climate of this island was warm enough for elephants, hyenas, tigers, hippopotamuses, and other inhabitants of southern countries whose remains have been brought to light here."

The most favourable opportunity for examining the canoes of the ancient Britons is afforded by the specimen now deposited in the British Museum, and which was dug up in Sussex about seven years ago. A full description of this canoe, and of the place where it was found, has been published in the 'Archæologia,' from the pen of Mr. Phillips; and from this account we shall borrow a few particulars.

The canoe was found in a ditch or drain near the village of North Stoke, and not far from the left bank of the river Arun, from whence the town and castle of Arundel are named. The Arun winds round a meadow which appears to have been once covered by water, and in the midst of this meadow, imbedded in what seems formerly to have been a creek or drain, the canoe was found. One part of the canoe had been for a long time visible at about two feet below the surface of the water, and had been used as a support for one end of a flat wooden bridge which crossed the creek from one part of the meadow to another. It having been deemed desirable to make some improvements in the draining of the meadow, this canoe, which had hitherto been deemed nothing more than the trunk of a fallen tree, was brought to light. Eleven horses were required to drag the canoe from its muddy bed; and it was then found to be a hollowed oak trunk, thirty-five feet long, about two deep, and four and a half wide, the thickness of the sides and bottom being generally about four or five inches. There are three bars left at the bottom at different distances from each other, and from the ends, which seem to have served the double purpose of strengthening the bottom and giving firm footing to those who worked the canoe in the water: they are too low and narrow to have served for seats. After stating various reasons for supposing that this canoe was made by the ancient Britons, and that it had lain undiscovered in that quiet part of the country for the intermediate ages, Mr. Phillips remarks, "That in some very early period they (the ancient Britons) should have recourse to the mode in which the canoe, the subject of this paper, was made, to enable them to float upon their rivers for various purposes, though not recorded in their imperfect history, would have been but in conformity with what is known of the like invention by many other people in a similar degree of civilization; and it is adverse to reason to suppose that it should ever be done after the use of iron tools in dividing trees into planks, and the advantage of constructing vessels with wood so divided, became known and practised." To those readers who may not have seen this canoe in the British Museum, to which it was presented by the nobleman, the Earl of Egremont, on whose estate it was found, it may not perhaps be inappropriate to mention that the canoe is placed near the outer entrance from Great Russell Street, under the eastern arcade in the open quadrangle or court.

In many parts of the world at the present day canoes hollowed out of trunks of trees form the recognised boats of the natives. There is a tribe of Indians on the banks of the river Colombia in America who live almost wholly by fishing, and the canoes which they make for this purpose are of the following character: they are upwards of fifty feet in length, cut out of a single tree, either fir or white cedar, and capable of carrying thirty persons each; they have cross-pieces from side to side about three inches thick, and the gunwale of the canoe curves outwards, so as to throw off the surges of the water. In managing these canoes the Indians kneel two and two along the bottom, sitting on their heels, and wielding paddles from four to five feet long, while one sits in the stern and steers with a paddle of the same kind. The fearless unconcern with which the Indians manage these canoes, not only in moderately swift rivers, but even in boisterous seas, is said to be very striking. Should a surge throw the canoe upon its side and endanger its overturn, those to windward lean over the upper gunwale, thrust their paddles deep into the wave, apparently catch the water and force it under the canoe, and by this action not merely regain an equilibrium, but give their bark a vigorous impulse forward. Other tribes of Indians in the same locality, but unaccustomed to the regular use of canoes, adopt a very simple and primitive plan of providing a temporary bark: they procure the skin of some animal which they may have shot, extend it out flat, fasten sticks across from side to side in different parts, and place it on the surface of the water: the sticks prevent the sides from collapsing; and the skin, by sinking or bending in the central part under the weight of the rower, forms a recess or hollow in which he can sit.

Instead of hollowed trunks of trees, many rude nations make canoes, or rather rafts, of several solid trunks laid side by side, and fastened together. Such is the *balsa* of South America, a name derived from that given to the tree of which the raft is made, and which is of a white, light, and spongy character. The balsas are, or were, used by the natives on the shores of the Guayaquil river for fishing, for trading, and for passage. The logs, sometimes as many as nine in number, are fastened to each other only by withies, with which the cross logs are also lashed to them, yet so securely as seldom to give way. The thickest log of the balsa is placed so as to reach farther than the others: at the stern another log is lashed to this on each side, and others to these, till the intended number be completed; the large log thus serving as a stay and foundation for the others. The larger sort of these balsas usually carry about twenty-five tons, without endangering the cargo by the too profuse access of sea-water; because, from the peculiar manner in which the logs are attached one to another, the whole assemblage accommodates itself to the motion of the water, and thus prevents the splashing which is so liable to affect a rigid and water-proof boat. These balsas work and ply to windward like a keeled vessel, and keep their course before the wind very accurately: this is effected by the use of some large planks called *guares*, three or four yards long and half a yard broad, which are set up vertically both at the stem and stern: by moving these boards in different directions, as occa-

sion may require, the balsa is made to 'sail large,' to 'tack,' to 'bear up,' or to 'lie-to' (to use nautical phrases), with tolerable ease.

If the log-raft just described bears some similarity in material to the hollowed-trunk canoe, there is also some resemblance, in lightness and frailty, between the ancient coracle and the birch-bark canoe of modern America. Many of the Indians on this continent, as well as the white traders who navigate the innumerable lakes and rivers of the interior, are accustomed to use canoes made of birch-bark, sewn together with fibres of the spruce fir, and coated with a resinous or gummy substance which exudes from the pine-trees of that continent. The material used is so extremely light, that a canoe thirty or forty feet long, and capable of accommodating eight or ten men, and of bearing a freight of four tons, can itself be easily carried on the shoulders of six or eight men.

Many of the South Sea Islanders are accustomed to use boats called *ivahahs*, and another form called *pahies*, in their warlike and trading expeditions from island to island; but as these vessels are built of planks extending upwards on either side of a central keel, and have a kind of deck, they form specimens of a more advanced stage in the art of boat-building, and do not lie within our present limits.

## ELIZABETH WOODCOCK.

PERHAPS one of the most remarkable instances of the preservation of life is that of Elizabeth Woodcock, who survived a confinement under the snow of nearly eight days. A short account of this poor woman's sufferings during and after the period of her imprisonment may not be uninteresting to our readers. On the 2nd of February of the severe winter of 1799, she was returning from market on horseback, about seven o'clock in the evening, along the road between Cambridge and Trumpington. Much snow had fallen in the course of the day, which, in consequence of the violence of the wind, had drifted in some places to a considerable height. Her horse, being alarmed at some meteoric appearance, became so restive that she was obliged to dismount and lead him. She was thus continuing her road homewards when the animal again started and broke from her. She immediately set off in the hope of overtaking him, and succeeded in doing so after having pursued him for about a quarter of a mile. She had hardly grasped the bridle, when she sank down by the road-side completely exhausted, and the horse again escaped from her. The place where she fell was by the side of a hedge, against which the snow was accumulating so rapidly, that in little less than an hour she was entirely enveloped. She was unable to make the necessary efforts to extricate herself in consequence of the stiffness of her clothes and the benumbed state of her limbs; and in this distressing position she remained until the morning of the 10th. During this time, from her own account, she appears to have slept but little, and her sufferings from cold and hunger were, as may be imagined, most intense. For the first two or three days she made several ineffectual attempts to free herself from her miserable captivity; but latterly her strength so utterly failed her, that she was obliged passively to resign herself to her melancholy fate. As soon as she discovered how completely she was covered in, she had recourse to the expedient of raising a flag as a signal of distress: this she effected by attaching her handkerchief to a stick and thrusting it through a small aperture which she observed in the snow above her head, and this ultimately proved the means of her rescue. She was frequently tantalized by hearing most distinctly the sound of carriages on the road near her, the different cries of the animals in the fields around, and the bells of the neighbouring villages. Passengers passed by her so close, that she could plainly overhear their conversation, although her loudest shouts were unsuccessful in attracting their attention. She once endeavoured to obtain some comfort from her snuff-box, but as she found that a pinch of snuff did not yield her the usual gratification, and she felt pain and difficulty in raising her hand to her head, she did not again try it. Towards the latter end of her imprisonment, she placed her two wedding rings, with the little money she had in her pocket, in a small box which she happened to have with her, thinking they would thus be safer, and less likely to be overlooked, if she died before she was discovered. On Friday the 8th, the sixth day of her confinement, a thaw having taken place, the snow around her began to melt, and the before-mentioned aperture enlarged so much as to hold out hopes to her of being able to effect her escape; but on trial, she found she had not sufficient strength to take advantage of this means of extricating herself from her dreary prison. It was about this time that she began to despair of being found whilst alive, as she felt that her end was rapidly approaching, and it is certain she could not have survived many more hours in this state. It was on Sunday, the 10th, that a young farmer, happening to pass near the hedge, observed the handkerchief which she had attached to the stick, and on examining the spot, discovered the opening in the snow. He was induced to look in by hearing sounds issuing from within, and to his astonishment clearly distinguished a female form, which he immediately recognised as that of Elizabeth Woodcock, whom he knew to have been missing for some time. He called two men to his assistance, and with their help succeeded in releasing her. She was so perfectly sensible as to know her deliverers by their voices, and to call them by their names. Her husband and friends were sent for, and arrived with a cart to convey her to her home. At her own request, she had some brandy and biscuit given her, which seemed to restore her greatly, but she fainted away on being lifted into the cart.

It appears that when her horse returned home, her husband, being much alarmed, started off in search of her. This he continued to do for several days, but he had entirely given over the hope of finding her, supposing that she must have been murdered on her way home.

Upon examination, her legs and feet were found to be partly mortified. He toes dropped off gradually in the course of the succeeding fortnight. This would not have happened if her feet had not been frost-bitten before she was covered with snow. Very little hope was at first entertained of her recovery, as her frame was considerably weakened by the excitement of receiving the visits of persons stimulated by curiosity to see the woman whose singular story naturally caused much interest in the neighbourhood. But towards the latter end of April her general health began to amend, and it was imagined that she would ultimately be restored, although the mutilated state in which she was left caused her to have but little comfort in the prospect that her life would be prolonged. Her case appears to have been very unskilfully treated, as mortification, it is thought, might have been prevented, if proper means had been used. She died on the 13th of July, 1799, after having suffered most severely for five months. She was in the forty-second year of her age. There is some reason to suppose, however, that indulgence in the use of spirituous liquors was the cause both of her accident and her death.